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SYSTEM AND METHOD FOR AN INFORMATION HANDLING SYSTEM HOUSING LID RELEASE

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BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates in general to the field of information handling system housings, and more particularly to a system and method for information
10 handling system housing lid release.

Description of the Related Art

As the value and use of information continues to increase, individuals and businesses seek additional ways to process and store information. One option available to users is information handling systems. An information handling system
15 generally processes, compiles, stores, and/or communicates information or data for business, personal, or other purposes thereby allowing users to take advantage of the value of the information. Because technology and information handling needs and requirements vary between different users or applications, information handling systems may also vary regarding what information is handled, how the information is
20 handled, how much information is processed, stored, or communicated, and how quickly and efficiently the information may be processed, stored, or communicated. The variations in information handling systems allow for information handling systems to be general or configured for a specific user or specific use such as financial transaction processing, airline reservations, enterprise data storage, or global
25 communications. In addition, information handling systems may include a variety of hardware and software components that may be configured to process, store, and communicate information and may include one or more computer systems, data storage systems, and networking systems.

Information handling system manufacturers typically seek to assemble system components for processing information in as small of a housing as practicable within defined cost constraints. Some considerations typically taken into account with the design of desktop information handling system housings are the working space
5 needed to assemble the processing components in the housing and the post-manufacture service and modifications that the manufacturer or users may perform. To address these considerations, information handling system housing designs typically have a lid that opens to expose the interior of the housing. Housing lids generally attach at multiple points along the housing so that the lid remains securely
10 attached to the housing to protect the internal components and prevent inadvertent opening of an operational system. Both the housing and lid are typically fabricated from relatively thin sheet metal in order reduce weight and provide some degree of electromagnetic shielding.

Some difficulties that result from the small size and minimal thickness of
15 information handling system housings and lids include complex arrangements for securely coupling the lid to the housing and difficulty in manually grasping a lid once the lid is released from the housing. Typically lids couple to a housing at multiple points that involve multiple manipulations of release devices to unsecure the lid from the housing. For instance, in one common arrangement screws, buttons or knobs
20 disposed on opposing sides of the housing are each released or otherwise activated in a two-handed operation and then the lid is manually disengaged and lifted from the housing. Often, internal coupling arrangements not visible to the user, such as hooks, slots and hinges, force the user to manipulate the position of the housing to obtain the leverage needed to completely release the lid. In some cases, users have difficulty
25 discerning between intended coupling arrangements and residual friction of coupling parts, resulting in application of excessive force that damages the housing and lid. Even after the lid is fully unsecured from the housing, the thin material tends to make manual handling of the lid for removal from the secured position difficult to accomplish.

SUMMARY OF THE INVENTION

Therefore a need has arisen for a system and method which removes an information handling system lid from its associated housing with improved simplicity.

In accordance with the present invention, a system and method are provided
 5 which substantially reduce the disadvantages and problems associated with previous methods and systems for removing an information handling system lid from its associated housing. An actuator accessible from the exterior of an information handling system housing activates a latch to release the lid and then pushes the lid relative to the housing to move the lid to an unsecured position so that the lid is
 10 accessible for manual removal from the housing.

More specifically, an exterior lid removal knob rotationally couples through the information handling system housing to translate a user activation to an interior cam actuator. Upon initial rotational movement of the actuator, a latch push formed in the cam activator moves a latch to an open position to release a latch catch coupled
 15 to the lid and allow movement of the lid relative to the housing. Subsequent rotational movement of the actuator rotates an inclined surface formed in the cam actuator into contact with a lid removal protrusion to translate the actuator rotational movement into a linear force that pushes the lid relative to the housing. The inclined surface induces adequate movement of the lid relative to the housing so that hooks
 20 formed in the lid slide out from under slots formed in the housing to unsecure the lid from the housing for manual removal of the lid. Springs bias the actuator knob to the locked position and the latch to the closed position so that resecuring the lid to the housing is accomplished by sliding the hooks into the slots and engaging the latch catch in the latch to prevent the hooks from inadvertently sliding out from under the
 25 slots.

The present invention provides a number of important technical advantages. One example of an important technical advantage is that an information handling system housing securely couples with a lid in a manner that simplifies removal of the lid from the housing. The actuator disengages the lid from the housing with a one-
 30 handed operation for simplified lid removal that uses an intuitive, easy to understand

rotation from a closed to an open position. The inclined surface of the cam advantageously overcomes friction in the initial disengagement and lid opening to reduce the risk of damage from the use of excessive force and moves the lid to a position more easily accessible to the grasp of a user's hand.

5 **BRIEF DESCRIPTION OF THE DRAWINGS**

The present invention may be better understood, and its numerous objects, features and advantages made apparent to those skilled in the art by referencing the accompanying drawings. The use of the same reference number throughout the several figures designates a like or similar element.

10 Figure 1 depicts a top perspective view of an information handling system with its lid removed to expose the interior of its housing;

Figure 1A depicts a top view of the interior side of an information handling system lid that fits over and covers the top opening of an associated housing;

15 Figure 1B depicts a top view of latch catches sliding against inclined edges of a latch;

Figure 2 depicts a top rear perspective view of a latch in the closed position with a spring biasing the latch against the actuator latch push;

20 Figure 3 depicts a top rear perspective view of initial actuator movement that moves the latch to the open position and brings the inclined surface into contact with the lid removal protrusion.

DETAILED DESCRIPTION

Removal of an information handling system lid from an associated housing is supported by a one-handed rotational operation of an actuator that releases the lid and moves the lid to an unsecure position for manual removal. For purposes of this disclosure, an information handling system may include any instrumentality or aggregate of instrumentalities operable to compute, classify, process, transmit, receive, retrieve, originate, switch, store, display, manifest, detect, record, reproduce,

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handle, or utilize any form of information, intelligence, or data for business, scientific, control, or other purposes. For example, an information handling system may be a personal computer, a network storage device, or any other suitable device and may vary in size, shape, performance, functionality, and price. The information handling
5 system may include random access memory (RAM), one or more processing resources such as a central processing unit (CPU) or hardware or software control logic, ROM, and/or other types of nonvolatile memory. Additional components of the information handling system may include one or more disk drives, one or more network ports for communicating with external devices as well as various input and
10 output (I/O) devices, such as a keyboard, a mouse, and a video display. The information handling system may also include one or more buses operable to transmit communications between the various hardware components.

Referring now to Figure 1, a top perspective view depicts an information handling system 10 with its lid removed to expose the interior of its housing 12.
15 Housing 12 retains and protects in its interior the components of information handling system 10 that are needed for processing of information, such as a CPU 14 and memory 16 that are coupled to a motherboard 18, and a fan 20 that is for introducing cooling airflow to the interior of housing 12. Figure 1A depicts a top view of the interior side of a lid 22 that fits over and covers the top opening of housing 12. Lid 22
20 has opposing hooks 24 that align with and fit into slots 26 formed in housing 12 so that sliding lid 22 relative to housing 12 engages hooks 24 into slots 26 and secures lid 22 to housing 12. Lid 22 is locked into a secure position by opposing latch catches 28 that engage in a latch 30 to prevent hooks 24 from sliding out of slots 26. Figure 1B depicts latch catches 28 sliding against inclined edges 34 of latch 30 to overcome
25 a bias provided by a spring 32 that otherwise holds latch 30 in a closed position. Once latch catches 28 push open and past latch 30, spring 32 returns latch 30 to the closed position so that a perpendicular blocking surface 36 prevents latch catch 28 from sliding out of latch 30. When latch 30 engages latch catch 28, it prevents lid 22 from sliding relative to housing 12 and thus secures lid 22 to housing 12 with the
30 engagement of hooks 24 in slots 26.

Referring again to Figure 1, release of lid 22 from housing 12 is accomplished with an actuator 38 that translates a user selection to unlock lid 22 into both a release

of latch 30 and a pushing of lid 22 from its secured position to release hooks 24 from slots 26. An external actuator 40 on the exterior of housing 12 rotates from a closed position approximately 90 degrees to an open position. The rotation of external actuator 40 translates to an internal cam actuator 42 that releases latch 30 with a latch push 44 and pushes lid 22 with an inclined surface 46. Latch push 44 presses latch 30 to the open position upon initial rotational movement of cam actuator 42 and maintains latch 30 in the open position through subsequent rotation of cam actuator 42 so that latch catches 28 are free to pass past blocking surface 36. Inclined surface 46 pushes against a lid removal protrusion 48 extending from lid 22 into the interior of housing 12 as depicted by Figure 1A. As cam actuator 42 rotates, inclined surface 46 increases the distance that lid 22 is pushed in proportion with the distance of the incline so that latch catch 28 is removed from latch 30 and hooks 24 are pushed out from under slots 26. Lid 22 is then easily accessible for physical lifting and removal from housing 12 by a user.

Referring now to Figure 2, a top rear perspective view depicts latch 30 in the closed position with spring 32 biasing latch 30 against latch push 44. Cam actuator 42 is cylinder-shaped and forms latch push 44 as a missing portion of the cylinder. A spring 48 biases cam actuator 42 in the locked position. As depicted by Figure 3, initial motion of cam actuator 42 causes immediate movement of latch 30 to the open position as latch push 44 pushes latch 30 over the outer surface of cam actuator 42. Subsequent rotation of cam actuator 42 maintains latch 30 in substantially the same position established by the circumference of the outer surface of the cylinder-shaped cam actuator 42 so that latch catch 28 remains free of the blocking surface 36 of latch 30. However, subsequent rotation of cam actuator 42 moves inclined surface 46 to the upper portion of housing 12 to engage lid removal protrusion 48 extending down from lid 22. With latch catch 28 released from the opened latch 30, engagement of inclined surface 46 against protrusion 48 releases lid 22 for movement relative to housing 12. As the degree of rotation of cam actuator 42 increases, the distance that inclined surface 46 extends into the upper portion of housing 12 increases to push lid 22 an increasing distance by engagement with lid removal protrusion 48. Upon completion of rotation of cam actuator 42, inclined surface 46 pushes lid 22 to an unsecured position in which latch catch 28 is free from latch 30 and hooks 24 are free

from slots 26 so that lid 22 is easily removed from housing 12. Reattachment of lid 22 is accomplished by re-inserting hooks 24 into slots 26 and sliding lid 22 relative to housing 12 until latch catch 28 is engaged by latch 30.

Although the present invention has been described in detail, it should be
5 understood that various changes, substitutions and alterations can be made hereto without departing from the spirit and scope of the invention as defined by the appended claims.